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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/596,861

06/27/2006

Peter Larsson

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02/05/2009

ERICSSON INC.
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EXAMINER

JAMA, ISAAK R

ART UNIT

PAPER NUMBER

2617

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/596,861	LARSSON, PETER	
	Examiner	Art Unit	
	ISAAK R. JAMA	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) _____ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 29-42, 44, 45 and 47-54 is/are rejected.
- 7) ☒ Claim(s) 43, 46, 55 and 56 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>06/27/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. Figures 1, 2 and 3 are discussed in the background of the invention and should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: In Figure 2, the numbering of the relays is 215:1-215:5, but in the description, the numbering is 210:1-210:5; and in Figure 3, the numbering of the relays is 215:1-215:5 while in the description, the numbering is 305:1-305:2 and the mobile stations are also misnumbered. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) is required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing

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date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

1. Claim 29 is objected to because of the following informalities: On line 4 of claim 29, the phrase ".....signals from the based station...." is misspelled and should be changed to "base station". Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically teaches or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 29-32, 35, 36, 40-42, 44, 47- 49, 51 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Number 7,139,527 (Tamaki et al.) in view of the instant Application's admitted prior art.

4. Regarding claims 29, 30, 31, 32, 35, 36, 47, 48, 51 and 54 Tamaki discloses a method of performing communication in a two-hop wireless communication network, wherein a base station, at least one mobile station and a plurality of relay stations are engaged in, or in the process of establishing, a communication session [**Figure 4, base**

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station 406, repeaters 407 a-c, and a mobile station 408], and wherein the relay stations forward signals from the base station to the at least one mobile station **[Figure 4, column 6, lines 49-53]**, Tamaki further teaches a step of feeding back from the at least one mobile station, during the communication session, information on the communication quality to the base station; and, adapting in the base station the transmission to at least one of the relay stations which the mobile station has soft association with, in response to the communication quality feedback from the at least one mobile station and that the mobile station measures the channel quality on the pilot signal **[Column 6 & 7, lines 64-67 and 1-4]**. Tamaki further teaches a method of establishing by at least one mobile station a soft association to said plurality of relay stations by internally selecting a set of relay channels from said number of relay stations, said set of relay channels associated to the relay stations being candidates for use in the communication session. Tamaki also teaches a transmission path between multiple relay stations and a destination station **[Figure 4, i.e. connections between mobile station 408 and repeater stations 407a, 407b, and 407c]**. In addition, Tamaki also teaches that a multi-point wireless transmission repeater system whereby a case where the start of relay is determined, a control signal indicative of a relay start demand is sent from the mobile station to the base station. On receipt of the control signal indicative of the relay start demand, the base station determines whether the number N of repeaters managed by the base station satisfies the minimum number (threshold M) of repeaters required by the replay start demand or not. If it is satisfied, a control signal of relay operation directions for notifying of start of relay is transmitted to the repeater

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station and the mobile station [**Column 7, lines 16-25**]. But Tamaki fails to teach a plurality of relay stations having at least partially overlapping coverage. The instant Application's prior art teaches that a wireless systems employing repeaters (such as cellular base station with supporting repeaters) with overlapping coverage, a receiver may benefit of using super-positioned signals received from multiple repeaters [**Page 1, paragraph 0008**]. Therefore, it would have been obvious to a person of ordinary skill in the art to include the admitted prior art system in the communication network of Tamaki in order to establish the best possible link between a transmitter and receiver.

5. Regarding claim 40, Tamaki further discloses that the method comprises MIMO based communication between the transmitter and the relay stations [**Column 16, lines 23-28**].

6. Regarding claims 41, 42 and 44, Tamaki further discloses that the transmitter of a base station sends a vector T over channel matrix H , where each row of the matrix H corresponds to one or more relay stations using the same forwarding relay channel, and the matrix H comprises as many rows as there are relay forwarding channels [**Columns 1 and 2, lines 44-67 and 1-19**].

7. Regarding claim 49, Tamaki further discloses that the forwarding performed at the relay stations during a communication session is not essentially dependent on control signaling directly between the mobile stations and the relay stations [**Column 6, lines 57-63**].

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8. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Number 7,139,527 (Tamaki et al.) in view of the instant Application's admitted prior art, and further in view of U.S. patent Number 5,987,011 (Toh).

9. Regarding claim 33, Tamaki and the instant Application's admitted prior art has been discussed above. But neither Tamaki nor the instant Application's admitted prior art disclose that the mobile station determines bandwidth requirements based on a current application executed in the mobile station or anticipated future applications; and, said selection is based both on the relay channel quality measurements and the bandwidth requirements. Toh teaches a routing method for ad-hoc mobile networks whereby a high associativity of a node (mobile host) with other nodes enhances its communication capability and produces shorter hop routes. However, an increase in the number of active nodes in a wireless cell can cause greater contention for the available wireless bandwidth, resulting in lower throughput per mobile host. In an environment which is congested with mobile hosts, it is possible to dynamically adjust the transmission power of each mobile host such that both the cell size and the number of neighbors are reduced in order to achieve a reasonably high throughput while still maintaining acceptable routing performance **[Columns 18 and 19, lines 59-67 and 1-3]**. Therefore, it would have been obvious to a person of ordinary skill in the method of teaches in Toh in the combined system of Tamaki and the instant Application's admitted prior art in order to achieve maximum system utilization of the available bandwidth.

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10. Claims 34, 37 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Number 7,139,527 (Tamaki et al.) in view of the instant Application's admitted prior art, and further in view of U.S. Patent Number 5,987,011 (Fujiwara et al.).

11. Regarding claim 34, Tamaki and the instant Application's admitted prior art has been discussed above. But neither Tamaki nor the instant Application's admitted prior art disclose that the transmitted signal comprises an adjustment relating to delay diversity. Fujiwara further teaches the adaptation of the transmitted signal comprises an adjustment of parameters relating to delay diversity **[Column 7, lines 34-37]**. And regarding claims 37 and 52, Tamaki and the instant Application's admitted prior art has been discussed above. But neither Tamaki nor the instant Application's admitted prior art disclose fail to disclose that the feedback is a raw channel state information.

Fujiwara further discloses that the step of feeding back comprises the step of said mobile station feeding back raw channel state information to the base station **[Columns 4 & 5, lines 65-67 and 1-19; i.e. the destination station measuring a received signal-to-interference ratio (SIR)]**. Therefore, it would have been obvious to a person of ordinary skill in the method of teaches in Fujiwara in the combined system of Tamaki and the instant Application's admitted prior art in order to account channel conditions.

12. Claims 38, 39, 50 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Number 7,139,527 (Tamaki et al.) in view of the instant Application's admitted prior art, and further in view of U.S. Patent Application Publication Number 2002/0116715 (Apostolopoulos).

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13. Regarding claim 38, Tamaki and the instant Application's admitted prior art has been discussed above. But neither Tamaki nor the instant Application's admitted prior art disclose that the step of feeding back comprises the step of said mobile station feeding back processed channel state information to the base station. Apostolopoulos teaches a video communication system and method employing multiple state encoding and path diversity whereby the system can include a feedback link (e.g., a feedback channel) that can be utilized by the receiver to send information about the quality of each of the paths to the sender **[Page 3, paragraph 0048]**, and regarding claim 39, Apostolopoulos further teaches that channel coding techniques, such as Forward Error Correction Coding (FEC) or interleaving of data or packets, can be applied to the packets in each individual path or to packets across a number of paths **[Page 6, paragraph 007]**. Therefore, it would have been obvious to a person of ordinary skill in the method of teaches in Apostolopoulos in the combined system of Tamaki and the instant Application's admitted prior art in order to correct any errors.

14. Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Number 7,139,527 (Tamaki et al.) in view of the instant Application's admitted prior art, and further in view of U.S. Patent Number 7,006,461 (Kilfoyle et al.).

15. Regarding claim 45, Fujiwara further discloses the method of performing communication is preceded by a process of organizing relay stations so that the channels of at least two neighboring relay stations are essentially orthogonal and the coverage of the at least two neighboring relay stations are arranged to have substantial overlap.

Allowable Subject Matter

29. Claims 43, 46 and 55-56 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent Number 7,050,758 (Dalglish et al.) teaches a self-configuring repeater system and method for automatically configuring a first and second gain of a repeater in a telecommunications system. U.S. Patent Number 6,889,033 (Bongfeldt) teaches an intelligent gain control in an on-frequency repeater to control the gain in each one of wideband uplink and downlink signal paths. U.S. Patent Number 5,796,760 (Wiedeman et al.) teaches a multipath communication system optimizer.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ISAAK R. JAMA whose telephone number is (571)270-5887. The examiner can normally be reached on 7:30 - 5:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lester G. Kincaid can be reached on (571) 272-7922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/IRJ/

/Lester Kincaid/

Supervisory Patent Examiner, Art Unit 2617